On March 7, 1918 Jan Łukasiewicz, the Polish logician who formally originated multi-valued logics, delivered a speech at Warsaw University on the need for “indeterminacy” in formal logical systems. His was among the earliest recognitions that, in a process, space-time world, we must commit to what I call gradient evaluating; that gradient evaluating must become our dominant mode, with two-valued evaluations relegated to the subdomain of “special cases.”

By 1924, Korzybski, who knew the work of Łukasiewicz, had already extended Łukasiewicz’s formal indeterminacy views to a principle of general uncertainty to cover all human evaluating; given the characteristics of human symbol systems and nervous systems — we abstract. Drawing on Einsteinian insights, he affirmed that “all we know and may know is a ‘joint phenomenon’ of the observer and the observed.”

In 1927, the German physicist Werner Heisenberg, limiting himself to measurements attempted within the emerging field of quantum mechanics, enunciated his “principle of uncertainty,” derived from his realization that, because of the disturbing effect of the measuring instrument (the new electron microscope and its human manipulator), he could not specify at once the position and velocity of sub-atomic particles. An element of uncertainty was recognized at the subtlest level of observation and measurement yet achieved by humans.

By 1933, in Science and Sanity, Korzybski formulated Heisenberg’s uncertainty as restricted, a special case of Korzybski’s principle of general uncertainty.

Korzybski did not say that we cannot make relatively secure statements; he maintained that, becoming conscious of abstracting, we can attend to structure, we can achieve greater degrees of extensionality and make quite secure statements at a given date — and be prepared to revise those statements should new structural data require it. Loss of certainty does not imply the impossibility of confidence. Indeed, we become more secure if we adopt an uncertainist, prob-
abilistic orientation because our statements will become more likely to make structural matches with the (eventually) non-verbal domain we’re talking about. Greater predictability → greater security.

Let’s specify again (3) this, at first, mysterious seeming but rather simple notion of the structural, relational match between language events and non-verbal events.

![Bob's Left Hand, Dorsal View](image)

Here we have a non-verbal structure represented and, of course, I have labeled it. Now I make a statement about the ‘hand’: “There are eleven digits to Bob’s left hand.” My statement posits a structure (complex of relations) not found on the drawing and, if the drawing is structurally sound, not found on my non-verbal “left hand.” The structure of the language does not match the structure of the non-verbal event. (Yes, in a process, space-time world, my hand qualifies as an event.)

Eventually, in a given lifetime, the most insecure formulator must be the certaintist who is consistently buffeted by unpredictable, unanticipated, unexpected events; nervous systems do not take well to such repeated structural mismatches/insults.

We can summarize what I have said and the implications of those words with a labeled drawing I have used at Institute seminars: “The Uncertainty Umbrella.”
I note first that umbrellas are for protection, prophylactics against inclemency. Our recognition of and acceptance of uncertainty (probability, ‘fuzziness’) allows us to huddle with a smile under the Uncertainty Umbrella which represents an orientation, an expectational set more in keeping with events/structures in extra-neural space-time.

But once committed to uncertainty, we conscious abstractions can exert ourselves to ‘local’ precision, the lower-order responsibility to get it as ‘right’ as we can. Knowing that “the map is not the territory” in no way excuses us from making the very best map we can at space-time S-T (1 ... n). As we learn from Fuzzy Logic, Sets, etc., the acceptance of gradients related to temporality leads to greater precision in observation, and predictive map-making becomes more structurally congruent with what we’re mapping.

A quarterly report (map) of departmental activity within a corporation cannot represent ‘all’ of what happened during that quarter. It probably won’t represent all who made useful inputs (or otherwise) during that period. The report is not the quarter. The report-maker needs to remember that. But the report had better be as sharp and inclusive as it can be made,
otherwise, relatively secure predictions cannot be made on its basis; the department and the corporation may be headed for trouble.

The balance between uncertainty at the orientation level and precision at the here/now level of action, is what Korzybski recommended. The usefulness of this balance applies to all human evaluating— even to playing. (4)

NOTES AND REFERENCES


ADDENDUM

My use of quotation marks in this glossary is in conformity with the conventions of the General Semantics Bulletin. To wit:

SINGLE QUOTES (Extensional device)

1. To mark off terms and phrases which seem to varying degrees questionable for neuro-linguistic, neuro-physiological, methodological or general epistemological reasons.

2. To mark off terms used metaphorically, playfully, etc.
   a. ‘mind,’ ‘meaning,’ ‘space,’ or ‘time’ used alone, etc.
   b. “...the semantic reaction formulation could serve as a ‘bridge’... between Pavlovian classical conditioning and Skinnerian operant conditioning,” (Silverman)

SINGLE QUOTES (Standard usage)
To indicate a quote within a quote.

DOUBLE QUOTES (Standard usage)

1. To indicate a term or phrase used by some referred-to person but not necessarily indicating a direct quote. Example: What Korzybski referred to as the “semantic reaction.”

2. To indicate a direct quotation from a named source.


[Robert Pula's response to "Glossing Over Feminism" (see pages 440-454 in this issue) will appear in the Spring 1996 ETC.]
Knowledge, Uncertainty and Courage:
Heisenberg and Korzybski

by Robert P. Pula

In 1940 Gaston Bachelard published a statement which nicely focuses one of the human points I wish to make in this paper:

The psychological and even physiological conditions of a non-Aristotelian logic have been resolutely faced in the great work of Count Alfred Korzybski, Science and Sanity. ¹

An avowed continuator of Korzybskian formulations in the fields of neurology and medical epistemology, Russell Meyers, made a similar psychological observation in 1958:

Now that we are able to stand a little apart from historical developments and view his life’s work in some perspective, it can hardly be doubted that he grasped, as few had done before him and certainly none had so systematically and comprehensively treated, the abiding significance of linguistic habits and the communicative processes-in-general to all of Man’s thinking-and-doing, from his loftiest metaphysical, epistemological and mathematical efforts to the most casual, trivial and mundane performances of his everyday living. ...Korzybski’s position was wholly comparable to that of Copernicus and Galileo, who had been impelled by their private inquiries during the Renaissence to challenge the popular ptolemaic cosmology and aristotelian mechanics of their day. It required an uncommon personal integrity, an unusual brand of courage and a plenum of physical energy to spell out the overt and covert effects produced by these widely-pervading, pathologic neuro-semantic processes in the community of humans. Korzybski was, as we now know, quite up to this formidable task. ²

Quite different responses to the dawning non-Aristotelian age can be noted in the behavior of two of its hesitant giants in the 1920’s: Max Planck and Albert Einstein.

Kurt Mendelssohn, in The Quest for Absolute Zero (wherein he repeatedly notes the formational and relative character of “absolute zero” even if “it” should be achieved) described some of the preferences of Planck who inevitably affected the formulating and on-going semantic reactions of Planck as scientist:

The great success of the quantum theory which was demonstrated by Einstein’s and Bohr’s work at first over-shadowed the emptiness of the quantum concept as such. Only Planck himself remained reticent and cautious, realizing from the beginning that his great theory was sadly incomplete. As he saw it, there were two ways out of the dilemma: either the quantum concept was a mathematical oddity or it must have a deep physical meaning. For a long time he favored the first alternative. [Italics mine: RPP] His strong feeling that the laws of nature must be “absolute”, required that relations between physical quantities should be free from ambiguity.... He much disliked Boltzmann’s statistical approach because, to his way
of thinking, it debased the simple grandeur of thermodynamic quantities by having them interpreted in terms of probability. In his search for the correct radiation formula it had been a severe blow first to realize that only the statistical approach would lead to the truth... Even before his first paper on the radiation formula was published, Planck had tried, though unsuccessfully, to remove the quantum concept from his work. His main reason for failing to champion his theory during the years after the first publication and for ignoring Einstein's work on it, was the hope that he would find the way back to the continuity of classical physics. 3

Planck's deep commitment to certainty is again humanly noted by Mendelssohn:

Planck was a notoriously cautious man who, when asked a question by one of his research students would invariably reply: 'I will give you my answer tomorrow'. However, he knew no caution where the laws of thermodynamics were concerned, since he considered them as certainty. 4

Even Einstein, whose work forced the uncomfortable Planck to recognize 'the second alternative' (that the quantum had a deep physical meaning), was himself made uncomfortable by the increasing need for statistical and probabilistic methods and formulations right at the sharpest focus of greatest precision yet achieved by humankind: the new physics which he was helping to lead onto the stage of human awareness. At the Fifth Solvay Congress (1927) Born, Bohr and Heisenberg (led by Bohr) argued the famous case for resolving the apparent conflict between particle and wave models of atomic behavior with the formulation of *complementarity*. For our purposes here, we need only stress the, for Einstein, unacceptable conclusion that "...the probabilities tell all there is to tell." 5

Einstein not only felt uncomfortable with what he called "...this Heisenberg-Bohr tranquilizing philosophy," he opposed it vigorously. Failing to make his case in 1928, he returned to the 'attack' at the Sixth Solvay Conference in 1930 where he nearly 'won' but was again 'defeated' by Bohr and had to 'retreat', conceding that Heisenberg's principle of indeterminacy was valid, but maintained his objection to the notion that it was complete.

For the rest of his life Einstein searched for ways to overthrow the uncertainty principle. Banesh Hoffman points to "...his instinctive dislike of the idea of a probabilistic universe in which the behavior of individual atoms depends on chance." 7

Einstein summed up his intuitive feeling about the quantum theory in the picturesque phrase: "Gott würfelt nicht," which he used in various forms on many occasions. It can be ploddingly translated "God does not play dice." 8

His refusal (inability) to internalize the principle which he could not overthrow led Einstein to become increasingly an isolated figure among physicists (for whom 'uncertainty' threatened to become a new dogma) while he endured becoming the popular image of scientist-as-wizard.

These psycho-formulational points made here are not intended as an attempt to in any way minimize the achievements of the great men being discussed (how presumptuous that would be!); but precisely these semantic reactive aspects not ordinarily mentioned in discourse about scientific issues are what I want to stress later with relation to Korzybski's response to Heisenberg.
Leon Brillouin, in his instructive and curiously (for me) inspiring book, *Scientific Uncertainty, and Information*, makes some cogent remarks about the psycho-logics of scientific ‘laws’. We need them here:

...what is the actual value of laws and theories, and why do we assign so much worth to their discovery?

We may risk a new suggestion here: the importance of scientific laws may very well be due to the human factor. Our minds like to deal with theories and general laws, rather than large accumulations of unconnected data, which we find hard to memorize. The satisfaction of discovering a general scientific law corresponds to the personal pleasure of the scientist....

When we speak of value, pleasure, or satisfaction, we definitely introduce the human element....

Scientific laws have a special value for the human scientist, but they are human also in another respect: these laws are discovered by human minds; they are invented by human imagination. 9

The general-semanticist might object to Professor Brillouin’s (apparently) elementalistic split between ‘mind’ and ‘imagination’. But Professor Brillouin is not (to my knowledge) a Korzybskian general-semanticist and therefore owes us nothing in this respect. With that non-elementalist caveat, his continuing observations are useful, especially as they do not come from a general-semanticist:

A. The physical theory may be construed as a discovery made by the human mind. It goes further than the empirical results and it seems to represent an additional amount of information, an actual creation of negentropy by human thinking.

B. The physical theory can also be considered as a work of imagination, something like a piece of poetry. It adds a great deal to the original information; some of these additions may be valuable and some of them may have no value. This point of view was presented by some famous scientists and philosophers. 10

Well, the straw-man Aristotelian might say, which is it? Humans either discover or invent the ‘laws’ of ‘nature’. Brillouin eventually (as would a general-semanticist) opts for a blend of ‘both’ – theories may be naively considered ‘free’ inventions (‘imagination’) which must be tested on the basis of predictive value (‘discovery’, naively understood). 11 What I want to stress here is his awareness of the psycho-logical stresses which churn up at the core of human-scientific attempts to model ‘reality’. Kurt Mendelssohn puts his finger on what may be the most potent generator of epistemological tension: “...the human mind... delights in concepts of symmetry...”12

Symmetry or asymmetry? Certainty or uncertainty? The very tendency to ask such polar questions Korzybski would evaluate as a reflection of ‘Aristotelian’ patterns built into language (and, therefore, brain) structure. Some neurologists might suggest that the either-or tendency (which seems fundamentally symmetrical in implication) may derive from the ‘split brain’ inside the human skull, the hemispheres of which are described as superficially symmetrical (facilitated by he ‘echo’ effect across the corpus callosum) but deeply asymmetrical (divisions of labor, individual cells as space-time events, etc.). 13 Whatever the ‘reason’, most humans (including, in my view, those bra...
which express various ‘Eastern’ world views) seem propelled toward symmetry – the formulative closed shop – and here I see the evaluative mechanism which still makes Heisenbergian uncertainty so frightening to so many and makes Korzybski’s immediate acceptance of and generalization of Heisenberg’s principle so remarkable.

The formulation and propagation of the Uncertainty Principle (*Unbestimmtheit*: uncertainty or indeterminacy) by a group of workers at the vanguard of physics (and, therefore, the vanguard of what we may call ‘hard’ human knowledge) set the scientific world on its collective auditory cortex. Few could ‘believe their ears’. The shock value of Heisenberg’s (and Bohr’s and Born’s) formulation was comparable to the ‘jolt of observation’ on an atomic ‘particle’ – the scale was, however, cosmic rather than merely sub-microscopic; this paper is just one of a steadily increasing wave of reverberations: brains set oscillating through time-binding.

Here are some ‘ear witness’ accounts, a series of historically significant semantic reactions:

The principle of uncertainty... shook us all a good deal. After all, it said that nature could not be described as a rigid mechanism of causes and effects... all the successes of science, Newton’s successes and those of the nineteenth century, seemed to have been won hitherto by fitting nature with just this kind of machine. To say suddenly that at the bottom those causal chains are not true, that the whole thing cannot be done – that seemed a strange discovery, and a disagreeable one. 14

This picture of an objective real world around us is what we have inherited from the Greeks, and we must get rid of it through surgery of the mind, however cruel it may be. 15

The great French thinker, Henri Poincaré, pointed out in his *Science and Hypothesis* (1905, p. 145) that every generalization presupposes a belief in the unity and simplicity of nature. But since that time, so much of a ‘revolutionary’ nature had appeared – Heisenberg’s *uncertainty principle* is the most obvious – that the faith in the orderliness of nature has been shaken. For example, Professor G.N. Lewis tells us that we have not the slightest idea of whether the belief in the simplicity of natural law (uniformity of nature) is due to the structure of the objective world, or to some hitherto unanalyzed trait of human psychology.

...Can the acceptance of Heisenberg’s uncertainty principle be used to justify indeterminism? And if this is so, can causality ever be restored to science and rest on a firm foundation? 16

Heisenberg was, not surprisingly, quite aware of the disturbance he had created and aware of struggles within himself in internalizing his own formulation. This awareness led him in 1934 to state:

...we [should] continually follow the example of Columbus, who possessed the courage to leave the known world in the almost insane hope of finding land beyond the sea. 17

He had previously noted in 1932:
...we must not forget that a high price had to be paid for this... scientific concept of the universe. Progress in science has been bought at the expense of the possibility of making the phenomena of nature immediately and directly comprehensible to our way of thought. 18

Brillouin, in his characteristically forthright way, accepted the challenge and passed it on to his fellow scientists:

Whether we like it or not, these are the facts resulting from Bohr’s and Heisenberg’s famous discussions. 19

Bachelard brilliantly expresses the neuro-linguistic implications:

Realistic thought places the subject before the predicate, whereas experimentation in microphysics starts with predicates about predicates, with remote predicates, and then simply exerts itself to coordinate the various manifestations of a predicate. By converting the propositions, but in the muted form proper to non-Aristotelian logic which does not go so far as to postulate a subject in the absolute, one would obtain formulae less brutal in their opposition.

What then, finally, did Heisenberg (and Bohr) say?

The first thing I want to emphasize is that they were talking about almost nothing at all — surely as close to ‘nothing at all’ as any humans before them had been able to speak with any degree of non-Alice in Wonderland respectability. It was perhaps this very ‘Alice’ quality of the proceedings that gave Planck and Einstein pause.

(Let me apologize to the readers of this journal for carrying “coals to Newcastle” [or salt to Wieliczka] in repeating what they must know in their sleep. But since the uncertainty principle is at the heart of our discussion and since many who did not grow up in those planet-rattling days may be readers of this special issue, I dare to proceed.)

But this ‘nothing at all’ was quickly perceived to relate to everything in particular, and thus its still emerging impact.

To start with, Heisenberg saw his (and Einstein’s) activity as far less revolutionary than that of Copernicus.:

Copernicus’s idea was much more an import from the outside into the concepts of the science of his time, and therefore caused far more telling changes in science than the ideas of modern physics are creating today. 21

He considered that ‘revolutions’ in modern physics come not by upheaval from ‘outside’ but by consistent applications of theory from within. This perhaps explains why Einstein was not able to prevail against the Bohr-Heisenberg axis — he was hoist by his own (previously committed to) formulations.

Technically, the uncertainty formulation was necessitated by experiments in the mid-twenties in which attempts were being made to ‘observe’ positions of individual electrons (which even today many do not recognize as ‘only’ a convenient inference). Brillouin states the problem succinctly:

A new principle dominates physics now, the uncertainty principle, formulated by Bohr and Heisenberg. There is a limit to the accuracy of experimental measurements. The scientist seeks to
increase, as far as possible, the accuracy of his observations but he is always stopped by an insurmountable obstacle: the perturbations brought by the measuring device itself to the object measured. In former classical theories, it was admissible to ignore the role of the observer: it was thought that the experimenter observed what was going on around him; his presence was not supposed to influence the course of events. In astronomy, or in classical mechanics, this point of view is defensible. But when we examine atoms or electrons, we cannot look at these tiny elements without disturbing them. The coupling between the observer and the observed cannot be ignored anymore.

Let us try to sum up Bohr's conceptions on the subject: electrons, protons, mesons, photons — all these essential components of the material world cannot be considered as particles in the usual sense. We must conceive them as being between particles and waves. Our customary ideas, formed after the model of everyday life ['common sense' intuiting: PPP], do not apply to these ultimate elements. Their nature surpasses our understanding. In certain experiments, a corpuscular description is sufficient, but in other cases, the wave representation presents itself more naturally and the quantum conditions join the two interpretations which looked contradictory at first sight. If we use the model with particles, we have to give up describing their movements....

Absolute determinism does not apply anymore. Physical laws take on an essentially statistical value, but do not apply to the detail of the movement. 22

You can have either the position or the velocity; you may model the events as corpuscular or wave-like; you may even combine the two models using Bohr's complementarity formulations: no matter how you slice it, you are there, and "...the probabilities tell all there is to tell."

But why should these considerations, even now seeming so precious and specialized, have created such an uproar? Because workers within and outside the field of theoretical physics saw the implications for human evaluating in general.

Heisenberg participated in extending the uncertainty principle beyond the laboratory:

We have to discuss whether the scientist will once and for all have to renounce all thought of an objective time scale common to all observers, and of objective events in time and space [sicut erat!] independent of observation of them. Perhaps recent developments [1934] represent only a passing crisis. I tend to the opinion, for which there seems to be the strongest evidence, that this renunciation will be final. 23

In 1934 he also made this observation:

The hope that new experiments will yet lead us back to objective events in time and space, or to absolute time, are about as
well founded as the hope of discovering the end of the world
somewhere in the unexplored regions of the Antarctic. 24

Here is another 1934 evaluation:
...modern physics has purged classical physics of its arbitrary belief
in its unlimited application. 25

And from the same year:
...the edifice of exact science can hardly be looked upon as a
consistent and coherent unit in the naive way we had hoped. 26

One year later, in 1935, Heisenberg said this:
...we must also become reconciled to the idea that even the
mathematically exact sections of physics represent, so to speak, only
tentative efforts to find our way among the wealth of phenomena.
This will obviously apply to modern as well as classical physics. For
if certain ambiguities of the time concept have been remedied by
relativity theory and certain ambiguities of the concept of matter by
quantum theory, yet there can be no doubt that the future
development of science will force further revisions and that the
concepts used at present will also prove to be limited in their
application, but in a sense as yet unknown. 27

And, finally, in 1941:
Science no longer deals with the world of direct experience
but with a dark background of this world brought to light by our
experiments. But this means that, in a way, this objective world is a
product of our active intervention, and improved techniques of
observation. Here, too, then, we are brought face to face with the
limitations of human understanding which we cannot overcome. 28

Most of these statements were made in lectures given in Germany during the thirties. The
last one was given in Budapest in 1941. This raises the fascinating question of how one of the
fathers of indeterminacy fared and could fare under the most absolute tyranny yet achieved on earth.
No doubt some future student of the interface ‘science-society’ will examine this from the point of
view of Bronowski’s Science and Human Values.

In 1940 Gaston Bachelard, very much concerned with generalizing Heisenberg, made some
telling comments:
...an object statistically localized by ordinary intuition is wrongly
specified.
...contemporary science wishes to know phenomena and not things.
It is in no way thing-conscious. A thing is merely an arrested
phenomenon.
...we must think of objects as being essentially in movement and seek
for the conditions under which they can be considered to be at rest, as
if fixed in intuitive space; we must no longer conceive objects, as we
used to do, as being naturally at rest – as things used to be – and seek
out the conditions which permit them to move. 29

Or, as I have said in other contexts, “Not things changing, but change thinging.”
In his early *The Common Sense of Science*, Jacob Bronowski also took Heisenberg out of the laboratory:

Heisenberg showed that *every* [italics mine: RPP] description of nature contains some essential and irremovable uncertainty.... We may have what metaphysical prejudice we choose, whether the future really and truly, essentially, is determined by the present. But the physical fact about these small scale events is beyond dispute. Their future cannot be foretold with complete assurance by anyone observing them in the present. And of course, once we have any uncertainty in prediction, in however small and distant a corner of the world, then the future is essentially uncertain — although it may be *overwhelmingly probable*.

I have said that this principle of uncertainty refers to very small particles and events. But these small events are not by any means unimportant. They are *just the sort of events which go on in the nerves and brain and in the giant molecules which determine the qualities we inherit* [my italics: RPP]. And sometimes the odd small events add up to a fantastic large one.  

The sections in the above quoted passage which I have italicized will be of concern later when we discuss the brain as the ultimate measuring instrument and Bronowski's apparent 'retreat from uncertainty' in the years before his death in August 1974. But in *The Common Sense of Science* Bronowski was an enthusiastic 'uncertaintist':

It was a discovery, and it has had a profound effect. But it does not seem so strange or unsettling now. On the contrary, to my generation the principle of uncertainty seems the most natural and sensible remark in the world. It does not seem to us to have taken the order out of science. It has taken out the metaphysics and left what had long been forgotten, the scientific purpose....

In order to act, it is not necessary to have a metaphysical belief that the rules by which we are acting are universal and that all other rules are just like them. On the contrary, at bottom all general beliefs of this kind are at odds with the principles of science....

At bottom then, the principle of uncertainty states in special terms what was always known [sic!], which is this. Science is a way of describing realities; it is therefore limited by the limits of observation. Anything else is not science, it is scholastics.  

Brillouin is just as emphatic and more explicit:

We cannot abstract ourselves from the world. We form, together with it, an inseparable whole. There are no actors and spectators but a mixed crowd. The modern scientist must absolutely renounce the idea of a real objective world. What science does is to supply us with representative models capable of imitating regularities (or laws) which we observe, and to enable us to reason about them. The models constitute the physical representation of the world, such
as defined by Planck. *Physical models are as different from the world as a geographical map is from the surface of the earth.*

Shades of Korzybski!
The observer-observed continuum as a source of uncertainty is frankly faced:

*Observation and perturbation inevitably go together, and the world around us is in perpetual flux, because we observe it.* [Italics mine: RPP]

Professor Brillouin is not, of course, saying that the world is in flux only because we observe it, but that our observing activities constitute an additional flux factor.

His most challenging statement is addressed to his fellow scientists:

*Statistics, probabilities, and averages – these seem all we know from Einstein’s relations, and the situation is exactly similar for absorption and emission of radiation of any kind....*  

It is necessary to emphasize these fundamental facts because too many scientists still remain under the impression that all elementary laws should be similar to those of classical mechanics that are supposed to be strictly deterministic. This is not the case. Elementary physical laws are all expressed by statistical formulas. No exact prediction is possible (at least for the present) and everything is irreversible!

Of the scientists I am quoting, Mendelssohn makes perhaps the most overt reference to general human issues:

Heisenberg’s uncertainty principle has profound consequences, not only in physics but quite generally in philosophical considerations involving the question of determinism and free will. Any statement dealing with the dimensions of $h$ [Planck’s constant] or less is merely metaphysical speculation and can never claim to have meaning as far as individual events are concerned.

The macroscopic laws of physics are fortunately saved by statistics since they always represent averages over large numbers of these individual events.

For some, awareness of the uncertainty principle was like having the plug pulled before the bath is finished. As Mendelssohn observes, “...the macroscopic laws of physics are fortunately saved by statistics.” This is important because it reminds us that ‘uncertainty’ does not ‘mean’ that we are scientifically ‘free’ to say anything we please, nor does it ‘mean’ that we are unable to specify within limits. Marjorie Swanson made this corrective point very muscally at an Institute of General Semantics seminar in 1958:

Modern physics has contributed two important notions to present day philosophy – the relativity principle and the uncertainty principle. Together, these two notions pretty well annihilate any hope of ever finding ‘absolutes’ of any kind testable by scientific methods. However, they originated in the midst of very rigorous systems of reasoning and on the basis of very accurate measurements of various
kinds of events. They do not offer excuses for careless observation and sloppy reasoning. 36

This seems a necessary warning in the 'Age of Aquarius' when so many boulevard empiricists seem to think that because of the scientific community's own recognition of its own limitations (and for other reasons) 'anything goes' — that, reversing the old burden of proof arguments, "If you can't prove that something is not true, it's okay to assert that it is true." For some, the 'release' from scientific determinism seems to have provided an impetus toward pseudo-scientific license.

What of Korzybski in all this? As already shown in the passages from Bachelard and Meyers, Korzybski met uncertainty head on — in, I can't resist saying it, no uncertain terms. More rigorously and vigorously than most others, he saw and accepted the broad implications of Heisenbergian uncertainty for the general community of humans, not just the scientific minority. In my view, Korzybski not only saw these implications more clearly than Heisenberg himself but, continuing our psycho-historical emphasis, accepted uncertainty more courageously and thoroughlygoingly than did Heisenberg.

Korzybski's major explicit published reactions to the uncertainty principle (formulated in 1925 and debated, as we have seen, in 1927 while Korzybski was working on his magnum opus) appeared in Science and Sanity (1933). First of all, and this seems necessitated by the still heard criticisms that Korzybski failed to give due recognition to his partners in formulating, Heisenberg is one of those to whom Science and Sanity is dedicated. Specifically, the dedication is to the works of those listed "which have greatly influenced my enquiry...."

Throughout Science and Sanity Korzybski uses passages from Heisenberg to introduce sections of his book and as chapter heads. 37 What most concerns us here is his semantic reactions to the Heisenbergian stimulus. Korzybski distinguished two kinds of uncertainty: Heisenbergian (restricted) and Korzybskian (general). Here are some sample quotations that show Korzybski formulating the 'restricted' character of Heisenberg's principle:

It was found that the 'absolute' division of the 'observer' and the 'observed' was false to facts, because every observation in this field disturbs the observed. The elimination of this elementalism in the quantum field led to the most revolutionary restricted 'uncertainty principle' of Heisenberg, which, without abolishing determinism, requires the transforming of the two-valued A 'logic' into the infinite-valued semantics of probability. 38

Having discussed the human nervous system as an 'abstracting,' integrating mechanism (a point we shall return to) Korzybski again refers to Heisenberg:

Under such conditions, the restricted 'uncertainty principle' of Heisenberg becomes a structural, most revolutionary and creative general principle.... [Of which more below: RPP] 39

And finally:

Heisenberg's restricted principle of uncertainty is also the result of the application of non-elementalism, based on the observation that the 'observer' and the 'observed' cannot be sharply divided. 40
But Korzybski is most concerned to state his *generalization* of uncertainty, related to but *consciously more broadly applied* than Heisenberg’s. As we will see, part of Korzybski’s genius lay precisely in his ability to generalize from quantum physics to the symbolizing nervous system *and back again*.

Because the nervous system is an abstracting, integrating mechanism, all human psycho-neurological reactions and, particularly, psycho-logical, to be similar in structure, *must* be based on the mathematical theories of statistics and *probability*. On the objective level [the level at which we perceive-integrate ‘objects’] we deal with absolute individuals, and so all statements of higher order abstractions can only be probable. Historically, mathematicians have elaborated not only both theories, but Boole, in his *Laws of Thought*, extended the mathematical approach to ‘logic’ in connection with the theory of probability. Finally, the difficulties of the law of excluded third have been solved by Łukasiewicz and Tarski in their ‘many valued logic’ which, when N increases indefinitely, merges with the mathematical theory of probability, a result reached independently by a different type of analysis in the present system. Any possible future scientific Å, non-el ‘logic’, which I call general semantics, must be built on this structurally more correct formulation....Under such conditions, the restricted ‘uncertainty principle’ of Heisenberg becomes a... *general principle*....

The ‘strictly linguistic’ point is emphasized in this passage relating to the ‘laws of thought’ of Aristotle:

...the ‘law of identity’ is never applicable to processes. The ‘law of excluded third’, as it is sometimes called, which gives the two-valued character to A ‘logic’, establishes, as a general principle, what represents only a limiting case and so, *as a general principle*, must be unsatisfactory. As on the objective, un-speakable levels, we deal exclusively with absolute individuals and individual situations, in the sense that they are not identical, all statements which, by necessity, represent higher order abstractions, must only represent *probable* statements. Thus we are led to ñ-valued semantics of probability, which introduces an inherent general principle of uncertainty. ...Korzybski clearly recognized the relationship between Heisenbergian uncertainty and his own non-identity formulations:

The present Å system was formulated in a way independent of other systems, as it was the direct result of structural semantic researches *free from identification*. This led to the formulation of fundamental *general* principles which underlie all human ‘knowledge’ and so leading to a general principle of uncertainty; ñ-valued general semantics.... It is naturally very reassuring to find that the newest most important achievements of science have followed
these principles unconsciously and have applied them before they were explicitly formulated. 43

Some may dispute that last assertion as it may apply to individual scientists working on particular problems (as a system claim, Korzybski’s statement seems justified to me); but that will not detain us here.

Korzybski explicitly relegated Heisenberg’s principle to the status of a ‘special case’ in two crucial passages:

This principle becomes a particular instance of the general principle of uncertainty.... 44

...any positive statement about levels must be only probable in different degrees, which introduces a fundamental and entirely general A principle of uncertainty. Heisenberg’s restricted principle in physics appears only as a special case... the older two-valued determinism must be reformulated into the $\infty$-valued determinism of the maximum probability. 45

This last statement states again Korzybski’s (perhaps) most scientifically significant formulation about language: the formulation that all statements are only probable. A full examination of this issue is beyond the scope of this paper, but it is relevant to the applied epistemological level and the psycho-historical aspects that we have been examining, so I will say a few words about it.

We have already seen that many scientists, philosophers, etc., were disturbed by the uncertainty principle. Many looked to the then emerging three- (or multi-) valued logics as a linguistic prophylactic for uncertainty, especially since, at least in the case of Łukasiewicz, commitment to indeterminacy had preceded Heisenberg’s 1925-1927 formulations. (Łukasiewicz’s first paper on indeterminacy, which spawned his three-valued logic, was published in 1906):

Łukasiewicz... claimed that the universally accepted conviction that nature is governed by casual necessity was ‘only a premature and unscientific formulation of the data of experience’. The indeterministic conviction so strongly expressed in this essay resulted perhaps from his scrutiny of the concept of cause. But it is equally feasible that his indeterministic outlook preceded the essay and gave rise to it. He defended his conviction with unswerving determination for the rest of his life.... the origin of the three-valued logic was in a way a by-product of his defense. 46

Skolimowski (quoted above) further observes that:

The philosophical significance of a many-valued logic was assessed differently by different people. Łukasiewicz himself thought that his creation was comparable with the creation of non-Euclidean geometries. Some people, notably Reichenbach, saw in it a solution to difficulties in which modern physics found itself after Heisenberg stated the principle of uncertainty. 47

Oliver Reiser, in a book which scientific epistemologists ‘should’ read with admiring care in spite of its mystical inclinations, makes a similar point and brings us back to Korzybski:
Not only has this situation given rise to much philosophical argument; even logic has been scrutinized to see if it offers a way out of the puzzle. For example, Hans Reichenbach has sought to interpret the quantum mechanics in terms of a polyvalent logic, a probability logic with a continuous scale of values having ‘truth and falsity’ as limiting extremes. Those interested in keeping the record straight may wish to recall that Korzybski and the present writer (among others) have also explored the possibilities along this line. On the other hand, Bertrand Russell, Ernest Nagle, William Werkmeister, and Henry Margenau (to mention several) have rejected the attempts at interpreting quantum mechanics and the wave-particle dilemma in terms of a multi-valued or non-Aristotelian logic. 48

(See the discussion of Margenau on ‘invariance under transformation’, below.)

Korzybski, who was greatly influenced by the pre-World War I and interwar school of Polish logicians and mathematicians, has a characteristic response: a polite bow of recognition followed by an insistence that we must go further:

The Polish school of mathematicians has produced the extension of the traditional two-valued A ‘logic’ to three- and many-valued ‘logic’; Chwistek has based a new foundation of mathematics and a new theory of aggregates on his semantic methods; but even these writers disregarded the general problems of non-elementalism, non-identity and the necessity for a full-fledged Å-system before their formulations can become free from paradoxes, valid, and applied to life. 49

Indeed, a careful reading of Skolimowski’s dissertation and of such primary collections as Łukasiewicz’s Selected Works 50 lead me to question whether Polish logic is non-Aristotelian at all.1 Surely, not in Korzybski’s sense: “...all statements are only probable in different degrees,” which I understand as saying that all statements are, most deeply, propositional functions, even those which are most explicit with all ‘variables’ ‘fixed’.

I accept the absolute individuality of events on the unspeakable objective levels, which necessitates the conclusion that all statements about them are only probable in varying degrees, introducing a general principle of uncertainty in all statements. 51

We return now to our central theme. Korzybski’s overall evaluation of Heisenberg’s work is most thoroughly presented in the last chapter of Science and Sanity proper. Only a few additional statements from those pages need be noted here:

The Heisenberg theory is also characterized by its thoroughly behavioristic, actional, functional and operational character. The number of unjustified assumptions is the lowest in existence and most of the identifications are eliminated. According to Heisenberg,

1 I no longer (1997) question this. The Polish school, if only by virtue of its multi-valued foundations, is clearly technically non-Aristotelian. I still hold the evaluations which follow in the rest of the paragraph.
electrons and atoms do not have the ‘same’ kind of ‘reality’ as ordinary objects of lower order abstractions. This conclusion, which underlies his whole work, is of particular importance structurally. 32

Because of its structure, the Heisenberg theory is a very functional one and there is little doubt that Heisenberg methods will be elaborated further and will be kept as a permanent checking method in physics. 33

There remains but to mention some more characteristics of the Heisenberg theory which seem to have very far-reaching structural and semantic bearings. This theory appears frankly statistical and introduces fundamental probability assumptions. The moment we realize that the human organism is essentially an abstracting affair and that abstracting is performed on different levels, or in different orders, it becomes obvious that statistical methods and probability notions become fundamental. 34

Why was Korzybski so receptive to Heisenberg and so ready to go beyond (particularly as involves neural functions, as we shall shortly see)? Partly, I think, because he was already intuitively (Manhood of Humanity, 1921) and analytically (Time-Binding: The General Theory, 1924-1926) committed to uncertainty. In both works just mentioned he had already achieved implicitly and explicitly his central formulation of non-identity. And partly because of (especially) his willingness to carry uncertainty into the subtilest electro-chemical ‘firings’ in the human brain and to the grandest probabilities-possibilities on the cosmic order with that uncertain characteristic mentioned in the title of this paper: courage. Formulational nerve. Epistemological guts. Whether or not (as some have suggested) this was partly traceable to his Polish heritage (a fascinating paper lies waiting there!), I won’t say. That he ‘had’ courage, there can be no doubt.

This is not a priority-establishing paper, but I would like to quote a few striking passages from the Time-Binding papers of the mid-twenties. These clearly demonstrate that Korzybski had already made the psycho-logical commitment to general uncertainty (non-identity of orders of abstraction) which were to be worked out explicitly and in great detail in Science and Sanity.

The first Time-Binding paper, delivered in abstract before the International Mathematical Congress, August, 1924 in Toronto, was characterized as “...a summary of a larger work on Human Engineering...,” i.e., Science and Sanity. Here is the opening gun (laser?) of that paper:

All human knowledge is conditioned and limited, at present, by the properties of light and human symbolism. 35

(Similar comments linking physics and linguistic issues were later made by Heisenberg in the twenties [quoted by Korzybski in Science and Sanity] and thirties. 36 Discussion of those is beyond the scope of this paper.)

Korzybski further noted in 1924:

The theory of relativity has established another fact, that all we know and may know is a “joint phenomenon” of the observer and the observed. 37

Man to be a man and think as a man must be a relativist, which is an inevitable consequence of the application of correct
symbolism to facts. He knows that he does not know, but may know indefinitely more...  

Gross empiricism is a delusion and he who professes it as a greed is probably more mistaken than the old metaphysicians were.

We see now that, as the structure of the atom is reflected in a grandiose manner in the structure of the universe, so is the structure of the knowledge of the individual man reflected in the collective knowledge of mankind.  

The second paper, delivered first before the Washington Society for Nervous and Mental Diseases in June 1925 and then to the Washington Psychopathological Society, has similar explicit adumbrations and some quite conscious expressions of the 'nerve' issue. Having discussed Russell's 'theory of types' with relation to his own formulation of orders of abstraction as shown in the 'Anthropometer' (Structural Differential), Korzybski observes:

Although Russell's theory and my own are strikingly similar, they are not the same thing; one works outside of mathematics [Korzybski's], where the other does not. It would be extremely interesting and instructive to inquire as to what extent Principia Mathematica itself pays tribute to Aristotle. This important problem looms in the foreground the moment we have the pluck to face non-aristotelianism candidly.  

...all human life is a permanent dance between different orders of abstractions.

...Psychologically Einstein made up his mind to talk sense or stop talking. He decided to see the world anew. He had to abstract himself to a very high order and free himself as much as possible from preconceived ideas, which are always implied by the accepted form of representation. He decided to see facts and label them anew. Helped by mathematical method and symbolism he succeeded. This involved a thorough-going behaviouristic attitude. But it was a new behaviourism in which the role of the observer is not disregarded.  

...all human knowledge is postational in structure.

As we have seen, Korzybski may be giving Einstein too much credit here, but his own commitment to transactional indeterminacy is clearly indicated.

I have already made several references to neurological issues as they apply to the Korzybskian generalization of uncertainty. Korzybski very early in his writing career (begun only in his middle years) recognized that the human brain itself is the ultimate measuring instrument; that no amount of 'extending the nervous system' by use of instruments would allow us to avoid this 'base line' responsibility; it is we who abstract. Since those pioneering times, from World War I through the frantic inter-war 'peace' period to and through World War II, we have learned much more about human brain function than Korzybski could know. We can only wonder at his prescience: his specifically neurological formulations (relating specifically to the process of abstracting, orders of abstraction, etc.) have 'become' increasingly descriptive of the best, most
recent information we have. Given the length of this paper, one supporting example (legions could be cited) must suffice.

In January 1974 I attended a lecture at the Johns Hopkins University Medical School in my native city. The lecture was given by Doctor Vernon B. Mountcastle, chief of neurological research for the Hopkins Hospital-University complex. Dr. Mountcastle’s lecture, delivered to keep the Hopkins medical community ‘up to date’ re brain research, was titled ‘The View From Within.’ As I listened to the first part of his lecture (perhaps the first fifteen minutes) I was pleasantly shaken to my non-Aristotelian foundations – I could even allow myself the fantasy that Dr. Mountcastle spoke in a deep bass with a rich, ‘r’-rolling Polish accent!

He made such points as: ‘reality’ as illusion; brain as only link to ‘reality’; sensation as set by encoding function of nervous system; perception as selection; perception as transformation (i.e., transducing of energy forms, e.g., light [electromagnetic] transmission, approximately 186,000 miles per second, as opposed to neural, electrochemical transmissions at approximate maximums of 225 miles per hour); he suggested perception as distinct from sensation; he suggested that isomorphism (similarity of representational structure) between brain event and non-brain event “looks to be the best we can hope for,” i.e., in general-semantics terms, the structure of a map can be (must be to be useful) similar to the structure of the territory it represents, etc.

Dr. Mountcastle described the fundamental steps in the process of abstracting; structurally-determined selecting, transducing, integrating, projecting (all non-verbal). The general-semanticist would merely add ‘talking’ (i.e., naming, describing, inferring, hypothesizing, theorizing, etc., etc.).

Dr. Mountcastle’s lecture proceeded to descriptions of precise measurements involving comparison of human with monkey brains, etc. discussion of conclusions to be reached re correlations between brain damage and behavior (much in the manner of A.R. Luria, finally reaching a very musical crescendo with observations that seemed to depress him and some of his audience, but which f, an already ‘committed’ uncertainist, found exhilarating:

- The brain is a prison
- all we ever know ‘directly’ about the ‘outside world’ is the result of sensory stimuli which have been transduced at peripheral levels
- there is some ‘commonality’ at peripheral levels; “beyond that, we are uniquely private.”

From the point of view of this neurologist, general (Korzybskian) uncertainty would appear to be not a theoretical probability but a behavioral certainty! Please note: certainty is a multiordinal term; being certain about un-certainty leads to markedly different conclusions-behaviors than being certain about certainty.

We have already seen an awareness of this problem in neuro-physics (which includes neuro-electro-chemistry as a subset) expressed by Bronowski above. This awareness is now becoming common property (even allowing for such disputes as that ‘raging’ around such formulations as the biochemical basis of ‘schizophrenia’). The information theoretician Jagjit Singh states the problem well:

...there is a kind of indeterminacy, which though quite different in essence [sic] from the famous principle of Heisenberg, is just as

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1 For a 1995 update, see Neuroscience Update 1995 in this volume.
effective a barrier to our understanding of the living brain. The indeterminacy arises from the fact..., that the more "micro" our neurological probe the less "macro" is our comprehension of the working of the cerebral cortex as a whole. 67

Singh makes a specific, Korzybskian neuro-linguistic point (in his case following Fournié) that the "surmise that human speech is a window on the working of the cerebral cortex may well be truer than we suspect at present." (1966) As part of this emerging neuro-semantic, neuro-linguistic 'wave', I too made a similar speculation in 1968:

Korzybski’s reaction to having internalized the mathematical notion of function may be suggested in this way:

If language is a function of brain, then by studying language we can learn something about brain-function. Apparently, as brain varies (evolution), so does language vary: \( L = f(B) \); as language varies (culture), so does brain vary: \( B = g(L) \). 68

What I want to stress here is the difficulties involved in such speculations related to research and formulating activities.

We have noted Mendelsohn’s extrapolation of indeterminism to such ‘philosophical’ problems as ‘determinism’ and ‘free will’. In a book on philosophy which is notable for its paucity of references to Heisenberg (not to mention Korzybski) D. M. MacKay makes this important but curiously innocent-sounding ‘admission’:

We are gradually accumulating evidence which suggests that brain tissue does behave according to the same physical principles as the rest of the body; and we know also that no behavior-pattern which we can observe and specify is beyond the capabilities of a physical mechanism. On the other hand, it is undeniable that some processes in the brain might occasionally be affected by physically indeterminate events of the sort which Heisenberg’s principle allows.

A kind of ‘reverse uncertainty’, wherein brain lesions do not lead to the sort of dysfunction we might expect, is pointed out in Edgar Miller’s Clinical Neuropsychology. 70

The foregoing may make it easier for us to appreciate Korzybski’s sharpest expression of general uncertainty: “Whatever you say something is, it is not.” The denial of identity, the assertion of non-identity (of orders of abstraction) grow out of Korzybski’s concomitant awareness of ‘absolute individuals’ as functions of a continuum – with the human brain, the inventor-discoverer of the ‘laws’ of physics, at its ‘center’.

Bachelard was very aware of Korzybski’s neuro-implications:

For Korzybski, the linkage of thought events is equivalent to a linkage of cerebral functions; to free oneself from certain habits of thinking is to break with cerebral determinism. 71

We may here, following Brillouin’s earlier quoted suggestion about the effect of information on ‘entropy’, regard Korzybski as a ‘hero of negentropy’.

Running through most of the many passages quoted in this paper (with the notable exceptions of Bachelard, Brillouin and Korzybski), I detect a tone of fear-tinged regret, a deep underlying yearning for certainty (or whatever we can salvage of it) in the face of grudgingly accepted but not internalized uncertainty. That continuing (culturally determined?) ‘need’ for
certainty, rather than the uncertainty formulations themselves, have, it seems to me, kept restricted and general uncertainty subjects of controversy. The formulations seem incontrovertible; the semantic reactions they trigger seem all the more intense and uncomfortable.

One way 'around' general uncertainty (which does not say that we cannot have relatively secure measurements at a time T) may be to give special emphasis to formulations of invariance. Henry Margenau's 1971 Alfred Korzybski Memorial Lecture, 'Invariance as a Criterion of Reality,' states the case well, although he seems insufficiently sensitive to the need for the modifier relative and runs afoul of Brillouin regarding the 'reversibility of time' (a formulation apparently very dear to closet absolutists). 72

Among those whose views have been examining, Bronowski seems to have made the most explicit 'retreat' from uncertainty. In the chapter "Knowledge or Certainty" from his The Ascent of Man, he even proposes re-naming and to some degree re-formulating the principle of uncertainty:

Yet the Principle of Uncertainty is a bad name. In science or outside it, we are not uncertain; our knowledge is merely within a certain tolerance. We should call it the Principle of Tolerance. 73

Bronowski goes on to use the word 'tolerance' in its engineering and social senses:

All knowledge, all information between human beings, can be exchanged only within a play of tolerance. 74

Even though Bronowski points out that certainty as used by Heisenberg implies "zero tolerance" and that "What makes the principle profound is that Heisenberg specifies the tolerance that can be reached," 75 the shift from uncertainty to tolerance appears to me to be a dangerous hedge. The very social tolerance which Bronowski so passionately yearned for may be on-goingly threatened if we constantly insist on the 'relative certainties' (invariances) that we 'have' 'within limits'. As a formulation of psycho-logics, tolerance (restricted Heisenbergian and Bronowskian) must be seen as a special case, a subset, an outgrowth of Korzybskian (general) uncertainty; a behavior deriving from an internalized formulative commitment.

Perhaps we require more consciously explicit semantic reactions to Korzybski's formulation of non-identity. Surely in the literature labeled 'general semantics' this formulation is often under-presented and under-understood. Korzybski is usually said to have formulated 'identity' as "absolute sameness in all aspects..." and rightly so.

...it must be stated that 'identity', defined as 'absolute sameness' in 'all' aspects, never to be found in the world, nor in our heads. Anything with which we deal on the objective [non-verbal] levels represents a process, different all the 'time', no matter how slow or fast the process might be; therefore, a principle or a premise that 'everything is identical with itself' is invariably false to facts. 76

But what Korzybski seems saying here (and in myriad similar statements) through his emphasizing the non-verbal, non-linguistic process ('objective') levels, is that 'identity', neuro-physiologically and neuro-linguistically, not only is "false to facts" if it asserts or implies "absolute sameness in all aspects," but that 'identity' is false to facts if it formulates absolute sameness in any aspect. All 'samenesses' are merely formulational—sometimes restrictedly useful (e.g., "We'll meet at the same time next week"), but "invariably false to facts."
Here seems the kernel of Korzybskian uncertainty. Any attempt to ‘pacify’ those for whom it may seem too brisk (we may picture the ‘epistemologist who came in from the cold’) may very well lead us to experience the historically familiar confusion of science and metaphysics and suffer again the very intolerance Bronowski so abhorred:

The Principle of Uncertainty or, in my phrase, the Principle of Tolerance fixed once for all the realization that all knowledge is limited. It is an irony of history that at the very time when this was being worked out there should rise, under Hitler in Germany and other tyrants elsewhere, a counter-conception: a principle of monstrous certainty.... 77

I owe it as a human being to the many members of my family who died at Auschwitz, to stand... as a survivor and a witness. We have to cure ourselves of the itch for absolute knowledge and power.

Less movingly expressed, may I suggest that we need the courage to recognize with Korzybski that most of our science-life problems seem to arise not from uncertainty but from mistaken certainty wrongly applied. R.L. Gregory’s cosmic caveat can serve as a reminder of the rigorous modesty we need as crucial equipment as we search out the future:

We are being cut off from the biological past which moulded the eyes and the brains of our ancestors. The Intelligent Eye is for the first time confronted with an essentially unpredictable future, where present object hypotheses are bound to fail. As we create so we must adapt to what we have created; the danger is that we may create a world beyond the restraints of our intelligence: a world we cannot see. 79

Abstract

More deeply and broadly than Heisenberg, Korzybski formulated and accepted ‘uncertainty’ as a function of the abstracting process. This paper examines various historical reactions to Heisenberg’s restricted uncertainty principle and Korzybski’s formulation of general uncertainty. Recent researches, particularly in neurology, are shown to be supportive of Korzybskian uncertainty.

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Mountcastle, Vernon B. Lecture, “The View from Within” (from notes by R. P. Pula). Delivered before the Johns Hopkins Medical community, Baltimore, MD, 1974.


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4. Ibid., p. 147.


6. Ibid., p. 190.


8. Ibid., loc. cit.


10. Ibid., p. 21.


12. Mendelsohn, op. cit., p. 244.


18. Ibid., p. 43.


24. Ibid., p. 19.

26. Ibid., p. 27.
27. Ibid., p. 48.
28. Ibid., p. 79.
29. Bachelard, op. cit., p. 94.
31. Ibid., pp. 70-72.
33. Ibid., p. 52.
34. Ibid., p. 52.
35. Mendelssohn, op. cit., p. 141.
38. Ibid., p. 107.
39. Ibid., p. 310.
40. Ibid., p. 541.
41. Ibid., p. 541.
42. Ibid., p. 310.
43. Ibid., p. 43.
44. Ibid., p. 405.
45. Ibid., p. 760. Actually, this quotation, included in "Supplement III" of Science and Sanity, is from a paper delivered in 1931 before the American Mathematical Society.
47. Ibid., p. 64.


52. Ibid., p. 715.

53. Ibid., p. 715.

54. Ibid., pp. 715-716.


58. Ibid., p. 15.

59. Ibid., p. 17.

60. Ibid., p. 22.


62. Ibid., p. 19.

63. Ibid., p. 27.

64. Ibid., p. 22.

65. I wish to stress that these remarks are based on notes I took at Dr. Mountcastle’s lecture. The factor of my own abstracting must therefore be kept in the foreground. I may have ‘heard’ only what seemed supportive of Korzybskian formulations. Nevertheless, to the extent that I have ‘quoted’ Dr. Mountcastle, explicitly or by implication, I believe the import of his remarks as transmitted here to be accurate.


74. Ibid. p. 365.

75. Ibid., p. 365.


78. Ibid., p. 374.

General-Semantics Seminar-Workshop Bibliography
Revised, Updated and Annotated, 1996

by Robert P. Pula

General-semantics, begun with Korzybski’s definition of humans as time-binders in 1921, presented as a system/discipline in 1933, has, in the last six decades, become a field. A public-sized library of books, articles, papers, studies, dissertations – even a few notorious novels – rest on shelves all over the planet. Some of them are excellent. Given the foundations of general-semantics, ‘its’ library needs to include writings from related fields. “So many books, so little time.” Our seminar bibliography, then, must be highly selective, limited to items that for historical as well as formational reasons I deem required reading for the well-informed, well-trained, understanding general-semanticist.

This bibliography does not include a preponderance of works in general philosophy. Nevertheless, I recommend that serious (not somber) students of general-semantics study (evaluate) at least a few surveys of the history of philosophy, the development of scientific paradigms (Ptolemy/Aristotle-Copernicus/Galileo, Newton, Einstein, ...) to get some perspective of where we fit (and don’t fit) in the evolution of human formulating. Korzybski dedicated Science and Sanity to those whose works “have greatly influenced my enquiry, ...” including Aristotle. We should have at least some familiarity with his work. Students seem not likely to develop a strong understanding of “non-Aristotelian” without a strong understanding of “Aristotelian,” especially since they represent a continuum.

I have included some detailed accounts of the work of the Polish mathematicians and logicians (and mathematical logicians) who influenced Korzybski in his non-Aristotelian direction. Serious, non- ‘gee-whiz’ training in general-semantics should include evaluating of Korzybski’s explications of the sciences he built his system on, aided by study of the writings of other scientists, both contemporary and more recent. Reading writings that have had to be translated can also promote your awareness of the planetary sweep of our enterprise. Some of those have been included.

Most of the selected works listed here deal directly with general-semantics or with reports which seem resonant with general-semantics formulations, 1921 ... 1933 ... 1995 .... I have also included some critiques which the student should be familiar with and, eventually, able to deal with. Works specifically treating general-semantics are marked: *.

The General Semantics Bulletin (1950...) and ETC: A Review of General Semantics (1943...) are rich in pertinent materials, particularly at the levels of explication and application. The Bulletin is generally the more rigorous and scholarly journal, while ETC more often (but not ‘always’) features pieces of the ‘familiar essay’ type. Both contain much of interest for those concerned with the history of general-semantics, biographies of leading formulators, etc.


Chapter 2, “Thirty Ways to Spot Quacks and Pushers,” provides a short course in enlightened skepticism à la Popper and Korzybski. To lighten the load, you might check out a video of The Inspector General (starring Danny Kaye) in which Walter Slezak flogs “Yakov’s Elixir” (good for everything) to the ‘great unwashed.’

**Berman, Sanford I.,** *Logic and General Semantics: Writings of Oliver Reiser and Others.* San Francisco (now Concord, CA): International Society for General Semantics, 1989. * Oliver Reiser was, like Bachelard above, an early academic philosopher (University of Pittsburgh) who became something of a ‘Korzybskian’. I say “something” because Reiser, formulator of a ‘world brain’, had a tendency to get excited. Nevertheless, he wrote some telling analyses of the shift from Aristotelian to non-Aristotelian, discussion of the Russell-Korzybski relationship, etc. Berman presents and discusses a rich dose of Reiser’s formulations, those of others, and some of his own. Two of Reiser’s books are listed below.


**Bochen斯基, I. M.,** *Contemporary European Philosophy.* Berkeley: University of California Press, 1961. A brief, clear, accessible account of philosophical trends of the first half of our century, trends of which Korzybski was partly an expression.


———, *Epistemics: The Science-Art of Innovating.* San Francisco: International Society for General Semantics, 1972. (Now publishing in Concord, CA.) Bois’ last and most personal book in which he appears as an exemplar of the formulational progression he has discussed here and in his previous publications. I have not starred it because Bois writes that Epistemics is “an emergent [My italics: RPP] from general semantics” and “a new science-art of utopia designing.” General-semantics qualifies as non-utopian.

Brillouin, Leon, Scientific Uncertainty, and Information. New York: Academic Press, 1964. A superior explanation for the ‘intelligent layperson’ of uncertainty, space-time, etc., and the role of the (human) scientist in discovering-inventing science, by a noted French physicist (the Brillouin Formula, Brillouin scattering, Brillouin zone, etc.) working in America. It helped me to appreciate Korzybski’s discussions in Book III of Science and Sanity.


———, “Towards a Philosophy of Biology,” (Alfred Korzybski Memorial Lecture) General Semantics Bulletin, No. 34, 1967, pp. 17-22. Cognizant in physics as well as biology, Bronowski concludes his typically brilliant lecture: “The living creature and its evolution are the two matched faces of life. In this pairing, evolution is the creative partner: it does not solve a problem, as the cycles of the organism do, but makes a genuine creation—a creature. We can say of it what Piet Hein said of a work of art, in a penetrating phrase: that it solves a problem which we could not formulate until it was solved.”

———, The Ascent of Man. Boston: Little, Brown, 1973. This lucid best-seller, based on Bronowski’s popular TV series for the BBC, draws on the anthropology and archaeology of art as well as on the ‘hard’ sciences. Can be read with Edelman’s Bright Air, Brilliant Fire (see below) for current evolutionary theory as it relates to the language/symbolizing form of life.

———, The Common Sense of Science. New York: Vintage, n.d. A brief, sturdy, surprisingly simple (but not simple—‘minded’) discussion of why the scientific way of evaluating is a superior way to get answers to those questions for which there may be answers. (Does not address such question-complaints as “Why was I ever born?!?”)

Carroll, John B., Selected Writings of Benjamin Lee Whorf. See below under “Whorf.”

Chase, Stuart, The Power of Words. New York: Harcourt, Brace and World, 1954. * A balanced discussion of various approaches and contributions to the examination of the role of language in human functioning, with emphasis on Korzybski’s work in Chapters 12 and 13. Avoids the exaggerations of Chase’s earlier Tyranny of Words, which led many to see general-semantics as an anti-higher order verbalization discipline, i.e., opposed to higher order abstractions without which we could not construct a science.


Churchland, Patricia Smith, *Neurophilosophy: Toward a Unified Science of Mind-Brain.* MIT Press, 1986. One of the better presentations of the (finally) emerging movement in the neurosciences that rejects the elementalistic split 'between' 'mind' and brain. Her language isn't yet up to Korzybskian standards, but she seems evolving in that direction, especially as she forthrightly faces up to epistemological issues. See my review listed in the separate Pula bibliography.


Einstein, Albert and Leopold Infeld, *The Evolution of Physics.* New York: Simon and Schuster, 1961. In a classic of popular scientific explanation (and that difficult, tender art, collaboration), two giants of twentieth century physics give a clear, non-mystical survey of the developments in physics culminating in Einstein’s non-Newtonian system and later developments. It will help you to understand why so much stuff on “Star Trek” is scientific baloney.

Gorman, Margaret, *General Semantics and Contemporary Thomism.* Lincoln, NE: University of Nebraska Press, 1962. * Originally published as Mother Gorman’s (she was for a time a Roman Catholic nun) doctoral dissertation at Catholic University as The Educational Implications of the Theory of Meaning and Symbolism of General Semantics in 1958, this excellent summary and respectful critique of general-semantics from the point of view of neo-Thomism makes very useful, exercising reading for a student of general-semantics, neophyte or veteran. The writings of Thomas Aquinas (1225-1274), credited with ‘baptizing’ Aristotle, still provide the major, disciplined philosophical underpinnings for Catholic theology. (Yes, I know, John Paul II is a fan of Husserl, Scheler, et al.) Evaluating responsible critiques of general-semantics provides an excellent way to check up on what of and how well you have learned the system. See also Black above, and Paulson and Youngren below.


Korzybski’s work, Hayakawa’s major book has been often reprinted, revised and re-editioned since its first iteration in 1939. Very well written, with apt applications to the teaching of English and general human communicating, it nevertheless misrepresents and misses some of the deeper epistemological implications of Science and Sanity. The student can usefully read it in conjunction with Bruce Kodish’s essay-review, “Getting Off Hayakawa’s Ladder,” General Semantics Bulletin, No. 57, 1993, pp. 65-76. Hayakawa’s other (later) books should also be examined.

Heisenberg, Werner, Philosophical Problems of Nuclear Science. (1952) New York: Fawcett World Library, 1966. An important discussion by one of the original formulators of (restricted) uncertainty, made piquant by the reader’s awareness that the author served the most certain tyranny (the Nazi one) known to history.

Hobson, J. Allan, The Dreaming Brain. New York: Basic Books, 1988. I have often preached in seminars that dreams qualify as home movies which we produce, direct, and in which we play all the parts. Dreaming is a very active process. We invent what we ‘receive’. Psychiatrist and neuroscientist Hobson puts flesh and bones on that assertion. He also makes this provocative statement about the procedures of psychoanalysts (having observed that the client-generated anecdotes they deal with do not even qualify as observations): “…their interpretation more closely resembles speculative literary criticism than it does scientific reasoning.” (p. 57)

Hofstadter, Douglas R., Gödel, Escher, Bach: An Eternal Golden Braid. (1979) New York: Vintage Books, 1980. I suggested in my review of this book (which the author thought was “kind”) that reader’s might be better able to handle it after having mastered some Korzybski: consciousness of abstracting, multiordinality of terms, neurolinguistic, neurosemantic effects (feedback), self-reflexiveness, etc. I claimed that there are “…reverberations, sympathetic vibrations between Hofstadter and Korzybski.” An adventure in abstracting. My review is listed in the separate Pula bibliography.


Infeld, Leopold, Albert Einstein: His Work and its Influence on Our World, Revised Edition. New York: Charles Scribner’s Sons, 1950. Einstein’s (and Born’s) collaborator again delivers remarkably non-obfuscatory clarifications: “Sometimes we hear that ‘time is a fourth dimension in relativity theory,’ and we are impressed by the mystical sound of these words. But there is nothing mystical about them. Events in the world must be described by four numbers, three of them referring to positions and one to time. Minkowski showed that it is much more convenient not to treat space alone as the background of our events, but spacetime.” (p. 45)

Janicki, Karol, Toward Non-Essentialist Sociolinguistics. Berlin and New York: Mouton de Gruyter, 1990. * The author credits Korzybski and Popper with being forerunners of what he calls “non-essentialist sociolinguistics.” He relies too heavily on Hayakawa to get to Korzybski; nevertheless, an important introduction to a kind of discussion that will soon lunch into the 21st century. See my review listed in the separate Pula bibliography.

Johnson, Kenneth, General Semantics: An Outline Survey. San Francisco (Concord, CA): International Society for General Semantics, 1972. * Written by a distinguished professor of the University of Wisconsin, this clear outline presents many of the main terms within an overview of general-semantics as a system, an orientation based on self-challenging, scientific ways of evaluating. For those who prefer their general-
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semantics in Italian, there is a translation (*Lineamenti di Semantica Generale*) by Massimo Baldini, with an introduction by Francesco Barone, published by Armando Armando (sic) in Rome.


Johnson, Wendell, *People in Quandaries: The Semantics of Personal Adjustment*. (1946) San Francisco (Concord, CA): International Society for General Semantics, n.d. * One of the classics of ‘first generation’ popularizations of and applications of Korzybski’s work, focused on adequate personal formulating. Use of the term ‘popularization’ may be misleading; this is a sturdily written book, very sound, which can serve as an introduction to the discipline for those who feel shy about starting off with *Science and Sanity*. The Institute’s current booklist characterizes Johnson’s book as ... “one of the finest and most accurate books yet written on the system of general-semantics.”


Kodish, Susan Presby and Bruce Kodish, *Drive Yourself Sane! Using the Uncommon Sense of General Semantics*. Foreword by Albert Ellis, Ph.D. Englewood, NJ: Institute of General Semantics, 1993. * Alfred Ellis, founder of the Institute for Rational-Emotive Therapy, wrote in his Foreword: “... it applies Alfred Korzybski’s brilliant general-semantics philosophy to its reader’s everyday lives and shows them how to live more sanely in a still highly irrational and partially insane world.” If you have a friend who you evaluate would benefit from reading some general-semantics, give them this book. Very user-friendly.


———, Selections from Science and Sanity. Introductory note by author. International Non-Aristotelian Library/ Institute of General Semantics, 1948. Selected and arranged by Guthrie E. Janssen. 7th Printing with additional materials, 1972. * Designed for those for whom the size and apparent complexity of the whole book proved daunting, this reduction and reordering of Korzybski's text, minus the technically scientific Book III, was accomplished by Guthrie Janssen as an experimental teaching text. Apparently, the experiment was successful, since it's in its 7th printing. Nevertheless, I consider study of Book III necessary for a solid grounding in general-semantics, especially for teachers.

———, Collected Writings: 1920-1950. Collected and arranged by M. Kendig. Final editing and preparation for printing by Charlotte Schuchardt Read, with the assistance of Robert Pula. Englewood, NJ: International Non-Aristotelian Library/ Institute of General Semantics, 1990. * Probably the most important publication in general-semantics since Science and Sanity. Not only required reading for study purposes, but fascinating as history. Includes Korzybski's last, great, paper, "The Role of Language in the Perceptual Processes," many items not seen since their first publication, and some not previously published. Their gathering here gives the reader an unprecedented opportunity to 'witness' the development of general-semantics up to Korzybski's death in 1950.

Kraft, Victor, The Vienna Circle. Translated by Arthur Pap. New York: Philosophical Library, 1953. The author (Kraft) describes the work of the school which, ignored in "the German cultural domain," influenced Russell, Wittgenstein and Korzybski. Had close connections with the Lwov-Warsaw School, sometimes called the Warsaw Circle, some of whose members are also included within studies of 'Austrian' philosophy. Compare with Barry Smith's Austrian Philosophy listed below.


about, gives an eyewitness account of the very human side of the mathematical school which influenced Korzybski's formulations.

Laszlo, Ervin, _Introduction to Systems Theory: Toward a New Paradigm of Contemporary Thought_. With a Forward by Ludwig von Bertalanffy. New York: Harper Torchbooks, 1972. In what might be called the Hungarian contribution to our discussion, Dr. Laszlo presents an excellent survey-in-depth of what I see as still current formulating in his subject(s). He appends a paper by Jere W. Clark which concludes with this passage—"... we would like to draw on the words of Sir Julian Huxley: 'we need a science of human possibilities, with professorships in the exploration of the future ... [to integrate] science with all other branches of knowledge, ideas and values relevant to man's destiny.'" Indeed. Both Laszlo and Clark participated in the general-semantics/general systems theory conference at Denver in 1970. (See Washburn and Smith, below.)

Lee, Irving J., _Language Habits in Human Affairs: An Introduction to General Semantics_. With a Foreword by Alfred Korzybski. (1941) 2nd Edition, Edited by Sanford Berman, 1994. Concord, CA: International Society for General Semantics.* Republished in conjunction with the Institute of General Semantics, Lee's book was probably Korzybski's favorite among the explications of his work (although he also thought highly of the work of Harry Weinberg, listed below). Irving Lee was an excellent writer and had a special gift for explaining general-semantics derived from and applied to 'real' (extensional), non-trivial events and situations. His discussion of "The Four 'Is'es'" seems particularly apt, perhaps to be read before and after you read Bourland's approach. Particularly recommended.

———, _How to Talk With People_. (1952) San Francisco (Concord, CA): International Society for General Semantics, n.d.* An excellent handbook for improving communication in small groups. I used it, and the title listed below, in committee process workshops I gave for staff at a major psychiatric hospital in Baltimore in the late 1970's.


Luria, A.R. _Higher Cortical Functions in Man_. London: Tavistock, 1966. An early confirmation of the neurophysiological basis for what Korzybski called levels/orders of abstracting, and his descriptions of the _mechanisms_ of abstracting, by the famed Russian neuroscientist who was at the leading edge of research when he wrote this book.


———, “The Place of Aristotelian Logic in Non-Aristotelian Evaluating: Einstein, Korzybski and Popper,” General Semantics Bulletin, Special Commemorative Issue (100th Anniversary of Korzybski’s Birth), No. 47, 1980, pp. 106-111. * Reflect on this: most of you reading this (and surely I who wrote this) won’t be around for the 100th anniversary of Korzybski’s death in 2050. Get serious! Distinguishing a two-valued logic from a two-valued orientation, Mayper places Korzybski in some fine company, concluding that he remains “the greatest system-builder of the century.”

———, “Korzybski’s Science and Today’s Science,” General Semantics Bulletin, No. 51, 1984, pp. 61-67. * Operating from our commitment to keep up with evolving science as a way of checking our on-going scientific underpinnings, Dr. Mayper (Emeritus Professor, Chemistry, University of Bridgeport and former student of Sir Karl Popper in London) concludes: “Science and Sanity was a book ahead of its time, and, fifty years later, it still is.” He would probably still say that’s so in 1995.

———, “Wu Li Thinking About Physics,” General Semantics Bulletin, No. 51, 1984, pp. 68-82. * In this essay-review, Mayper (no mean punster) does a sharp delineation of the degrees of wooliness he sees in three popular (and actually popular) books about ‘physics’ by Pagels, Capra and Zukav. Mayper begins: “I can characterize them bluntly by saying that Pagels’ is a very good book with careless spots, Capra is a careless book with good spots, and Zukav [The Dancing Wu Li Masters] is an infuriating book: so promising in prospect and so bad in execution.” And you thought general-semanticsists were supposed to be a bunch of warm-fuzzyists!


Dr. Mayper’s less-formal, ruminative editorials in the Bulletin can also be read for profit.


———, “Potentials of General Semantics in the Age of Space.” Alfred Korzybski Memorial Lecture, 1958. *General Semantics Bulletin*, 1958, No. 22, pp. 3-12. * From the author’s concluding paragraphs: “Man is as ‘natural’ as anything in the universe and his role in the evolutionary process is in principle no different from that of the other ‘natural’ materials involved in the vast drama of ‘Nature’.”

“It now appears that the issue confronting us is ... arriving at some sort of agreement ... that our goals should include maximal, self-actualizing health for every person on earth. ... it would appear in order that one of our goals is to emerge from a prescientific to a scientific culture.

“The prescription for this was published 25 years ago by Alfred Korzybski.”

And, in 1995, the Institute and others are still issuing that prescription.


———, “The Potentials of Neurosemantics for Modern Neuropsychology.” Alfred Korzybski Memorial Lecture, 1985. *General Semantics Bulletin*, No. 54, 1989, pp. 13-59. * A summary updating of much of what Dr. Meyers has written about throughout his long career (he is now [1995] a sparkling 91!), he declares on p. 15: “I regard Korzybski’s *Science and Sanity* as the most important book I have thus far read.” And “With few exceptions, such modest contributions to science as it has been my lot to make during the past 53 years have been mere applications of Korzybski’s broadly generalizable non-Aristotelian formulations ...” He then brilliantly details those applications within the context of twentieth century neuropsychology. If you’re studying general-semantics, you need to do yourself the favor of reading this.

Minteer, Catherine, *Words and What They Do to You* (1965). 5th Printing. San Francisco (Concord, CA): International Society for General Semantics, 1971. * The Institute’s booklist rates the late Catherine Minteer’s little book as “The most widely used of all teaching manuals for introducing general-semantics at the junior and senior high school levels.” When I introduced it to several hundred junior and senior high school English teachers in Baltimore County (the large county that wraps around Baltimore on the west,
north and east, reaching to the Pennsylvania border) in 1969, Minteer’s book was well received and absorbed into the county’s curriculum.


Mordkowitz, Jeffrey, “Korzybski, Colloids and Molecular Biology,” *General Semantics Bulletin*, No. 55, 1990, pp. 86-89. Jeff Mordkowitz, now President of the Board of the Institute, checks to see if Korzybski knew what he was talking about in the 1920’s and 1930’s and how that stacks up with current knowledge and usage.

Paulos, John Allen, *Innumeracy: Mathematical Illiteracy and Its Consequences*. New York: Vintage, 1990. The best-selling book which convinced many that they need not fear mathematics. Korzybski did not expect, and did not suggest, that everyone who studies general-semantics needs to become a mathematician; he did strongly urge that emerging non-Aristotelians develop a ‘feel’ for the mathematical way of looking at things; the recognition of mathematics as a specifically relational (structural) language, and its great value for structuring our personal way of evaluating. Paulos’ engagingly written book is the best I know for helping in accomplishing that. Highly recommended.

———, *Beyond Numeracy: Ruminations of a Numbers Man*. In a manner similar to Quine’s in *Quiddities* (see below), Paulos “ruminates” on many issues in philosophy, neurology, notions in mathematics, etc., all from a firmly mathematical orientation. In that regard, quite korzybskian. A more sophisticated follow-up to *Innumeracy*, but still not requiring expertise in math manipulating.

———, *A Mathematician Reads the Newspaper*. This lively, clear-eyed examination could well be subtitled “And the TV, and the radio, and public/private speech of all sorts.” Presents an array of examples of misleading and just plain wrong use of mathematics (statistics, probabilities, counting, averaging, percentaging, etc.) in most areas of public life, from the policy level through legislation to often disastrous implementation. Economics, science-as-practiced, eating hysteria, sports, pseudoscience in support of ‘alien abductions’, etc., are also stared at. An excellent multifaceted example of how mathematical evaluating can help create a saner world.

Paulson, Ross Evans, *Language, Science and Action: Korzybski's General Semantics – A Comparative Study in Comparative Intellectual History*. Westport, CT and London: Greenwood Press, 1983. Paulson’s is the first book I know of to so thoroughly place Korzybski within and beyond his sources. He devotes chapters to asking such questions as “What was the influence of Korzybski’s European, and specifically Polish, background on the initial formulation of his philosophical and semantic theories?”; “What was the influence of the American context...?”; “What was the impact of renewed contact with the Polish logical school [in Warsaw in 1929]...?”; and (you’ll love this one) “What happened to general semantic ideas and those who advocated them in the United States...?” Compare with Allen Walker Read, “Formative Influences on Korzybski’s General Semantics,” listed below, and Robert Pula’s “Korzybski’s Polish Matrix,” listed in the separate Pula bibliography.

"extensional/intensional orientations," the Structural Differential, etc. Some adults have reported it useful to them in sorting out some Korzybskian notions not previously clear to them.

Presby Kodish, Susan, "Reflections on Levels of Knowing and Existence by Harry L. Weinberg," General Semantics Bulletin, No 60, 1994, pp. 57-67. Dr. Presby Kodish wrote this piece in partial fulfillment of the requirements for certification by the Institute of General Semantics for teachers in general-semantics. She begins with a valuable discussion of the vexed question of "how to evaluate popularizations and explications of general-semantics." She presents some of Korzybski's stated requirements, lists six suggestions of her own, then applies those to Weinberg's book: "I found infrequent violations of the system and much to commend." (See below for the listing of Weinberg's book.)

Pula, Robert P. The numerous general-semantics writings of this author are listed in the separate Pula bibliography.

Quine, Willard van Orman, From a Logical Point of View: Logico-Philosophical Essays. Second Edition, revised. New York: Harper Torchbooks, 1963. 'Surely,' it must interest a general-semantics reader to see that the title of Quine's first chapter is "On What There Is." Much, much clarifying stuff here for someone who plans "to read a book sometime"\footnote{Korzybski to Charlotte Schuchardt [Read], c. 1938}.

Quine, Willard van Orman, Quiddities: An Intermittently Philosophical Dictionary. Cambridge, MA and London: Harvard University Press, 1987. An entertaining (in a 'brainy' way) set of brief essays that addresses many of the themes of twentieth century science, philosophy, mathematical logic, aesthetics, etc. – and quite a few issues that have been around for three thousand years (that's an approximation). Quine has been a major player in the games he describes. Here's an example of the kind of play he allows himself during a serious exposition (he has been discussing truth and beauty as polarities): "The alethic [truth] and aesthetic poles need a third, the ethical, to round out the immemorial TRINITY: the true, the good, and the beautiful. Still further ones clamor at the gates. (Block that metaphor. These are poles, not Poles.)" Quine thus illustrates one of my ideals: Let's be serious but not somber.

Rapoport, Anatol, Operational Philosophy. (1953) New York: Academic Press/Science Editions, 1965. Russian-born Anatol Rapoport, (who is also a brilliant pianist) was a close associate of Hayakawa. He had connections with European (primarily Austrian) logico-philosophical practitioners and seemed to approach Korzybski from their less 'engaged' (but not dis-engaged) perspective. Operational philosophy can be seen as cognate with the extensional orientation.


———, "Is There a Place for 'Mysticism' and 'Occultism' in General Semantics?" General Semantics Bulletin, No. 49, 1982, pp. 141-142. Reprinted as "The Place of 'Mysticism' and 'Occultism' in the Scientific Orientation" in The Humanist, Vol. 43, No. 5, Sept.-Oct., 1983, pp. 12-13, 46. * As we might expect, Dr. Read's answer is a qualified "No" – qualified by his awareness of the role that speculation, hunches, 'intuitions', even fantasy may play, especially at the beginning of a scientific quest. But the rigors of self-challenging scientific methodology and consciousness of abstracting function as a safeguard, disallowing commitment to 'mystical' or 'occult' programs. May be read with profit in conjunction with his paper on 'utopianism', listed below.

"Is General Semantics Compatible With Utopianism?" General Semantics Bulletin, No. 52, 1985, pp. 23-35. * A profound, wide-ranging discussion which concludes that general-semantics can be applied societally for amelioration, not 'perfection'.

"How Important Is the Terminology of Korzybski's General Semantics?" General Semantics Bulletin, No. 59, 1994, pp. 35-40. * Responding to some structurally unsound formulating by D. David Bourland, Jr., especially as he claims it to be korzybskian, Professor Read details his affirmation that "Terminology that reflects structure is important....."

Reiser, Oliver L., The Promise of Scientific Humanism: Toward A Unification of Scientific, Religious, Social and Economic Thought. New York: Oskar Piest, 1940. Numerous early approving references to Korzybski by this now too-little known philosopher who spent almost his entire career at the University of Pittsburgh and was for a time associate editor of The Humanist. Reiser (cf. Bachelard, above) places Korzybski firmly within the formulational world of his day but well understands how he extended it. He gave one of the earliest live, public discussions of Korzybski's methodology as presented in Science and Sanity before the AAAS in December, 1934.

"From Classical Physical to Modern Scientific Assumptions," in Papers from the Second American Conference on General Semantics. Compiled and Edited by M. [Marjorie Mercer] Kendig. Chicago: International Non-Aristotelian Library/Institute of General Semantics, 1943, pp.69-78. A concise delineation of scientific assumptions from Democritus to Korzybski, concluding that "The great merit of Korzybski's system is that he saw the implications of what was happening in the growth of physical science and mathematics and was able to anticipate what the consequences of these developments ('revolutions') would be for biology, psychiatry and sound education." This most interesting volume of 80 papers by some outstanding people (including, for example, Ora Ray Bontrager, W. Burridge, Francis P. Chisholm, Hervey Cleckley, David Fairchild [whose wife was the daughter of Alexander Graham Bell], S. I. Hayakawa, Wendell Johnson, Douglas Kelley, M. Kendig, Alfred Haldane, Skarbek Korzybski, Irving J. Lee, Robert Lord [producer of such movies as The Dawn Patrol, The Prince and the Pauper, Dodge City, One Foot in Heaven, etc.], Adolf Meyer, the founder of psychobiology, Ulroid Murray, Allen Walker Read, and Benjamin Lee Whorf) is out of print but may be consulted in libraries, including, by appointment, the library at the Alfred Korzybski Research and Study Center in Closter, New Jersey.

The Integration of Human Knowledge: A Study of the Formal Foundations and the Social Implications of Unified Science. Boston: Extending Horizon Books/Porter Sargent, 1958. Reiser seems not to have been able to evolve to seeing 'spiritual' factors as human nervous system events; like Bois, there appears a residual mystical inclination, some unconscious identifying, hankering after 'absolutes', etc. For example, on p. 235 he affirms: "But growth and evolution (physical and biological) types of motion or change in which physics has hitherto not been interested, are not [Reiser's italics] relative. These are forms of change (motion) to which present relativity considerations do not apply." Despite this, when he's being primarily descriptive of historical developments, Reiser functions as a stimulating guide to twentieth century science/philosophy. For a sympathetic discussion and evaluation of his work, see Dr. Berman's book listed above.
Rose, Steven, *The Conscious Brain*. New York: Vintage Books, 1976. Rose’s first book is still useful even though it’s now almost 20 years old. (In the burgeoning neurosciences updating is more critical in the late 1900’s than, say, physics.) He is one of the leaders in well-structured talking about one’s research. See my review in *General Semantics Bulletin* Nos. 44-45 listed in the Pula bibliography.


Schaff, Adam, *Introduction to Semantics*. New York: Pergamon/Macmillan, 1962. Perhaps the first major Polish evaluation of Korzybski, by a leading scholar whose main concern is to survey the field, tell what it’s about, and consider its problems. Part One is titled “Research Problems of Semantics” and includes chapters on “Linguistics,” “Logic,” “Semantic Philosophy,” and “General Semantics.” Not surprising for a (then) official Marxist, Schaff is critical of Korzybski in the first half of his chapter, then writes (p. 100): “For all its oddity and its simply maniacal traits, Korzybski’s conception includes something which cannot be dismissed lightly.” And, loc cit, “Let me also point out to those with a liking for easy triumphs, that from the philosophical point of view Korzybski is sometimes a hard nut to crack precisely for a Marxist critic.” Interesting stuff.

*Scientific American*. Special issues on the human brain, September 1979 and October 1992 [check it]. Can be read to get a sturdy detailed sense of progress in the on-going investigation of the ‘organ of thought’; also inklings of how much more there seems to do. Language-brain relationships are covered.


Swanson, Marjorie A, *Scientific Epistemological Backgrounds of General Semantics*. General Semantics Monographs IV. Lakeville, CT (Englewood, NJ): International Library Publishing Company, 1959. Though using the now outmoded term ‘electro-colloidal’ (see Jeffrey Mordkowitz’s listing above), Dr. Swanson gives a thorough explication of scientific data as correlated with Korzybskian terminology. Delivered originally as lecture-demonstrations for Institute seminar-workshop participants, most of whom were not professional scientists, the written form is designed explicitly but not simplistically for any literate, adult non-scientist. Yet I have known several working scientists who have found her printed lectures clarifying and helpful for their own work and for promoting understanding in areas outside their realm of expertise.


Thayer, Lee, ed., *Communication: General Semantics Perspectives*. New York: Spartan-Macmillan, 1970. The curiously selected editor (by Ulroid Murray) comes close to attacking general-semantics. Based on his lack of knowledge, he says in his Editor’s Preface many curious things, e.g., “What Korzybski (and some of his followers) called for indirectly is a condition of life in which every man is perfectly adapted to his environment – and hence necessarily controlled by it. Such a science of man would be his ultimate dehumanization.” Sure might. But, as I trust you will learn in this seminar and your further studies, that
represents not at all what uncertainist general-semantics is about. At the personal and social level we are about amelioration. Despite Thayer’s misevaluations, the collection of papers in this book are very worth studying, some of them particularly so. Some authors represented are (alphabetically): J. Samuel Bois, D. David Bourland, Sister Margaret Gorman, S. I. Hayakawa, Kenneth Johnson, Wendell Johnson, M. Kendig, Stanley Krippner, Harry Maynard, Ulويد Murray, Neil Postman, the brothers Pula (Bob and Tad), Anatol Rapoport, Allen Walker Read and Charlotte Schuchardt Read.

Ulam, S. (Stanislaw) M., *Adventures of a Mathematician*. New York: Charles Scribner’s Sons, 1976. In telling the story of his life, the famed mathematician shares a world perspective on the development of mathematics from World War I through the seventies. His style is reader-friendly, even chatty, not full of formulae, since his purpose is not to teach math but to tell the human story of international mathematics via events in the lives of the mathematicians who made it.

**Washburn and Smith, eds.,* Coping with Increasing Complexity: General Semantics and General Systems Theory*. New York/London/Paris: Gordon and Breach Science Publishers, 1974. Results of a friendly encounter between general-semanticists (Institute of General Semantics) and general systems theorists (Society for General Systems Research) conducted during 'campus unrest' at the University of Denver in May, 1970. The papers printed here discuss how the two disciplines might correlate "in a mutually productive way." In 1970 the environment provided a penetrating backdrop of "... the ecological crisis, student unrest, information overload, alienation and depersonalization," increasing complexity — and the ongoing Vietnam War. One of the young professors at the conference, hearing the din outside our room, suggested that we suspend our deliberations, since he saw them as irrelevant given the state of the campus. I argued that precisely then was the time for us to persist in our nongentropic enterprise. We continued. Among the contributors: Bela Banathy, J. Samuel Bois, D. David Bourland, Jere W. Clark, Stuart C. Dodd, Alvin A. Goldberg, C. Andrew Hilgartner, Kenneth Johnson, Ellwood Murray, Robert Pula, Charlotte Read and Lee Thayer.


Weinberg, Steven, *Dreams of a Final Theory: The Scientist's Search for the Ultimate Laws of Nature*. Can be read as a companion piece to Lindley's *The End of Physics* (above). With perhaps more elegance and authority than Lindley, but with no less frankness, Nobel Prize winner Weinberg details the age-old quest for the 'absolute' and the need to face up to not having it.

qualify as, up to its date of publication, better than any other general text used in education courses for would-be public school teachers in America. Working from a general-semantics base, Weiss and Hoover address the whole range of topics, linguistic, scientific, philosophical, historical, etc., related to the educational endeavor. Recommended for general adult students of general-semantics, but especially those who are working on the firing line.


Wolenski, Jan, *Logic and Philosophy in the Lvov-Warsaw School*. Revised and translated by the author and Olgierd Wojtasiewicz. Synthese Library / Volume 198. Dordrecht / Boston / London: Kluwer Academic Publishers, 1989. A recent well-written report and analysis (a philosophical bestseller in Poland; Lee Auspitz [Commentary, June 1989, p. 58] reports that in a 1988 poll, Wolenski’s book was rated by young philosophers as one of the most important books published in the 1980’s) of the work by the school which has had (and is having) such influence in the world. Again, as are the other similar entries in this bibliography, listed here because of the influence on Korzybski and because I deem their study necessary for full understanding of Korzybski (how he is similar to and different from those antecedents) and helpful for sharpening one’s non-poetic formulating.

Youngren, William H., *Semantics, Linguistics, and Criticism*. New York: Random House, 1972. In his Preface Dr. Youngren, who intended to write a different book, tells us why he wrote this one: “When I thought about an introduction to the anthology [his original project], it occurred to me that general semantics would be a good point of departure. For while the direct influence of Korzybski and his followers was not nearly as strong as it once had been, I was convinced that it was still to their books that most teachers of English usually turned for answers to the large theoretical questions about language that lie outside the proper subject matter of linguistics—questions about how language works and how it is related to the outside world.” “The more I read, the more I wrote, and the anthology was gradually abandoned in favor of a book which would start with an examination of general semantics and then go on to elucidate what I took to be the most important relations of linguistics and linguistic philosophy to literary criticism.” (p. ix) A useful exercise for the student-reader can be to alertly distinguish when Dr. Youngren is dealing with “Korzybski,” “certain of his ‘followers’,” “general semantics,” and when he confuses the ‘three.’ Dr. Youngren also writes reviews for the bi-monthly American Record Guide.

Well, this should be enough to keep you off the street for a while or two. When you’ve ‘finished’ with these, you can read the 619 items listed in the bibliography to *Science and Sanity*. Happy formulating!
Program News:
The Sanford I. Berman Debate Forum Continues its Success

Within a very short time, the Sanford I. Berman Debate Forum has become one of the most successful new debate programs in the nation. Since its inception in fall 2006, the UNLV debate team has quickly become a shining star of excellence, attracting top debaters from all over the country to attend and debate at UNLV.

The enthusiasm of the program's director has translated into a team of disciplined and successful debaters. "Our objective is to consistently represent UNLV with one of the top ten debate teams in America," says Dr. Jacob Thompson, Director of the Sanford I Berman Debate Forum. "This team has boundless potential for future success, and we look forward to one day winning the national championship."

In its first year of existence, the team traveled to twelve tournaments, and although many may have underestimated the potential of such a new program, the team came back to UNLV with twelve awards for their performance in various divisions. This year, the District Qualifying Tournament in late February, UNLV qualified two teams for the National Debate Tournament, which will be held March 19-23 at the University of California at Berkeley.

The Forum serves the national debate community by hosting tournaments on campus, including the Las Vegas Classic Invitational Debate Tournament in October, which attracted more than sixty teams from all over the country.

The program director, along with assistant coaches and debaters also volunteer to coach and judge several local high school debate teams. This gives our students the opportunity to share their knowledge and support the next generation of debaters.

Understanding that the ongoing success of the program rests on the ability to recruit and retain the best and brightest students to debate for UNLV, Sanford and Sandra Berman recently made a gift for scholarship support in addition to the support they provide for the program each year. "This is another example of the Bermans' dedication to education and debate at UNLV," Thompson says. "We couldn't be more grateful."

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